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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,855	12/04/2003	Chun Hua Yang	121812.00005	7855
26710 7590 01/24/2007 QUARLES & BRADY LLP 411 E. WISCONSIN AVENUE SUITE 2040 MILWAUKEE, WI 53202-4497			EXAMINER BAYARD, EMMANUEL	
			ART UNIT 2611	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/24/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/727,855

Applicant(s)

YANG ET AL.

Examiner

Emmanuel Bayard

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 6-11, 15-20 and 22-24 is/are rejected.
- 7) ☒ Claim(s) 2-5, 12-14 and 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 22-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 22 recites the limitation "the threshold" in line 1. There is insufficient antecedent basis for this limitation in the claim.
4. Claim 23 recites the limitation "the filter" in 1. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 11 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Mueller et al U.S. Pub No 2002/0122509 A1.

As per claim 1, Mueller et al teaches a digital receiver, comprising: a frequency converter arranged to convert a received signal into baseband signals (see figs. 1-2, 4-5

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and 8 elements 10, 20 and 164 and pag2 1 [0006]; delay units arranged to delay the baseband signals to provide delayed signals (see figs. 2, 5 elements 27, 28, 88, 89 and page 1 [0006] and page 3 [0032]; normalizing means arranged to truncate the baseband signals and the delayed signals to a predetermined length and provide normalized signals (see figs 2, 5 combined elements 25-26, 30 and combined elements 82-85, 87, 90 and page 2 [0029] and page 3 [0045-0046]) ; a demodulator arranged to demodulate the normalized signals and provide a demodulated signal (see abstract and page 1 [0002] and page 2 [0030]); and frequency offset sensing means arranged to sense an envelope of the demodulated signal to provide an offset signal indicative of a frequency offset of the received signal (see page 2 [0014-0015], [0024-0025] and page 3 [0045]).

As per claim 11, Mueller et al teaches wherein the demodulator further comprises a power normalizing means arranged to generate a power signal from the normalized signals and provide a normalized demodulated signal to the sensing means (see page 2 [0014-0015], [0024-0025] and page 3 [0045]).

As per claim 15, Mueller et al inherently teaches wherein the frequency converter comprises: an analogue front-end arranged to convert a frequency of the received signal from a radio frequency into a low intermediate frequency to provide a low intermediate frequency signal.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller et al U.S. Pub No 2002/0122509 A1 in view of Suzuki et al U.S. Patent No 5,907,585.

As per claim 24, Mueller et al digital receiver, comprising: a frequency converter arranged to convert a received signal into baseband signals (see figs. 1-2, 4-5 and 8 elements 10, 20 and 164 and pag2 1 [0006]; delay units arranged to delay the baseband signals to provide delayed signals (see figs. 2, 5 elements 27, 28, 88, 89 and page 1 [0006] and page 3 [0032]; normalizing means arranged to truncate the baseband signals and the delayed signals to a predetermined length and provide normalized signals (see figs 2, 5 combined elements 25-26, 30 and combined elements 82-85, 87, 90 and page 2 [0029] and page 3 [0045-0046]) ; a demodulator arranged to demodulate the normalized signals and provide a demodulated signal (see abstract and page 1 [0002] and page 2 [0030]).

However Mueller does not teach a filter arranged to filter the demodulated signal to provide a filtered signal and wherein the filter is arranged to have a bandwidth which decreases as a function of time.

Suzuki teaches a filter arranged to filter the demodulated signal to provide a filtered signal and wherein the filter is arranged to have a bandwidth which decreases as a function of time (see figs.3, 7 element 34 and col.4, lines 43-67 and col.8, lines 64-col.9).

It would have been obvious to implement the teaching of Suzuki into Mueller as to decimate N samples in order to obtain smoothed time sequence signal as taught by Suzuki (see col.9, lines 33-50).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6-10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller U.S. Pub No 2002/0122509 A1 in view of Spilker U.S. Patent No 5,477,195.

As per claim 6, Mueller et al teaches all the features of the claimed invention except wherein the frequency offset sensing means comprises: means arranged to track the envelope of the demodulated signal to provide an envelope signal; and filter arranged to low pass filter the envelope signal to provide the offset signal.

Spilker teaches means arranged to track (see fig.8 element 42) the envelope of the demodulated signal to provide an envelope signal; and filter arranged to low pass filter (see fig.8 element 47) the envelope signal to provide the offset signal (see col.8, lines 31-67).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Spilker into Mueller as to adjust the tracking channel reference during acquisition and reduce the loop gain to its optimal as taught by Spilker (see col.9, lines 15-20).

As per claim 7, Mueller and Spilker in combination would teach wherein the filter is an adaptive IIR filter as to accurately adjust the tracking channel reference during acquisition and reduce the loop gain to its optimal as taught by Spilker (see col.9, lines 15-20).

As per claim 8, Mueller and Spilker in combination would teach wherein the sensing means further comprises a filter coefficient generator arranged to generate and adjust the coefficient of the filter as to adjust the tracking channel reference during acquisition and reduce the loop gain to its optimal as taught by Spilker (see col.9, lines 15-20).

As per claim 9, Mueller and Spilker in combination would teach wherein the filter coefficient generator reduces the filter coefficient as a function of time as to adjust the tracking channel reference during acquisition and reduce the loop gain to its optimal as taught by Spilker (see col.9, lines 15-20).

As per claim 10, Mueller and Spilker in combination would teach wherein the filter coefficient generator adjusts the filter coefficient according to the following:  $\alpha_n = \alpha_{n-1} + \frac{1}{256} \alpha_{n-1}$ , wherein  $\alpha_n$  is the filter coefficient at time  $n$ ,  $\alpha_{n-1}$  is the filter coefficient at time  $n-1$  as to adjust the tracking channel reference during acquisition and reduce the loop gain to its optimal as taught by Spilker (see col.9, lines

15-20).

As per claim 16, Spilker teaches wherein the frequency converter further comprises: an analogue-digital converter arranged to analogue-to-digital convert the low intermediate frequency signal to provide a digital signal (see fig.8 element 35-36); mixers arranged to respectively mix the digital signal respectively with sine and cosine signals to obtain two orthogonal components (see fig.8 elements 37-38, 42IM 42QM); and filters arranged to filter high frequency parts of the two orthogonal components to obtain the baseband signals (see fig.8 elements 42BF). Furthermore implementing such teaching into Mueller would have been obvious to one skilled in the art as to receive additive Gaussian noise which would be filtered a bandpass filter as taught by Spilker (see col.7, lines 55-60).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mueller U.S. Pub No 2002/0122509 A1 in view of Spilker U.S. Patent No 5,477,195 and in further view of Maggill U.S. Patent No 5,729,570.

As per claim 17, Mueller and Spilker in combination teaches all the features of the claimed invention except deciding means arranged to decide a tentative signal from the demodulated signal and the offset signal.



Maggill teaches deciding means arranged to decide a tentative signal from the demodulated signal and the offset signal (See figs. 4, 8 and col.5, lines 49-67).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Maggill into Mueller and Spilker as to obtain hard decisions outputs by taking the sign bit of the soft decision bits as taught by Maggill (see col.5, lines 51-54).

As per claim 18, Maggill teaches wherein the deciding means comprises a comparator arranged to compare the demodulated signal with the offset signal to provide the tentative signal (see fig.8 and col.5, lines 65-67 and col.6, lines 1-10).

Furthermore implementing such teaching into Mueller and Spilker as to obtain hard decisions outputs by taking the sign bit of the soft decision bits as taught by Maggill (see col.5, lines 51-54).

As per claim 19, Mueller, Spilker and Maggill in combination would teach wherein the deciding means comprises: a subtractor arranged to subtract the offset signal from the demodulated signal and provide a difference signal; and a comparator arranged to compare the difference signal with zero to provide the tentative signal as to obtain hard decisions outputs by taking the sign bit of the soft decision bits as taught by Maggill (see col.5, lines 51-54).

As per claim 20, Mueller, Spilker and Maggill in combination would teach further comprising a symbol timing recovery arranged to a symbol timing of the tentative signal as to obtain hard decisions outputs by taking the sign bit of the soft decision bits as taught by Maggill (see col.5, lines 51-54).

***Allowable Subject Matter***

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9. Claims 2-5, 12-14 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kranz et al U.S. Pub No 2002/0154679 A1 teaches use transceiver.

Gregory et al U.S. Patent No 5,233,351 teaches a local oscillator.

Lim U.S. Patent No 6,151,367 teaches a digital demodulator.

Takaki U.S. Patent No 6,775,336 B1 teaches a receiver.

Dent et al U.S. Patent No 6,195,399 B1 teaches a method and apparatus for converting wideband IF signal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 571 272 3016. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM)  
Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571 272 2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Emmanuel Bayard  
Primary Examiner  
Art Unit 2611

1/20/07

  
EMMANUEL BAYARD  
PRIMARY EXAMINER